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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/821,091	04/08/2004	Kevin W. Schlichting	EH-10972 (04-107)	8980
34704	7590	02/03/2006	EXAMINER	
BACHMAN & LAPOINTE, P.C. 900 CHAPEL STREET SUITE 1201 NEW HAVEN, CT 06510			ZIMMERMAN, JOHN J	
			ART UNIT	PAPER NUMBER
			1775	

DATE MAILED: 02/03/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/821,091

Applicant(s)

SCHLICHTING ET AL.

Examiner

John J. Zimmerman

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– The MAILING DATE of this communication appears on the cover sheet with the correspondence address –  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 23 November 2005.  
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1-25 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.  
10) ☒ The drawing(s) filed on 20 August 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.  
5) ☐ Notice of Informal Patent Application (PTO-152)  
6) ☐ Other: \_\_\_\_\_.

## OFFICE ACTION

### *Amendments*

1. This Office Action is in response to the Amendment Under 37 C.F.R. 1.111 received November 23, 2005. Claims 1-25 are pending in this application.

### *Claim Rejections - 35 USC § 103*

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schaeffer (U.S. Patent 5,843,586) in view of Wukusick (U.S. Patent 6,074,602) and further in view of applicant's disclosure of the prior art.

4. Schaeffer discloses that coated single crystal substrates used for combustor liners (e.g. see column 3, lines 40-59; column 1, lines 15-30) can have their crystallographic orientation optimized so the low modulus directions (e.g. [001]) will correspond with the maximum strain (e.g. see column 4, line 33 - column 5, line 34). Schaeffer discloses that the thermal and

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mechanical stresses induced during operation of the turbine components are greater in different directions and that Schaeffer's invention identifies thermal and mechanical stresses regions of fcc single crystal components and orients the crystallographic directions accordingly (e.g. see column 5, line 35 - column 6, line 14). While the examples of Schaeffer are primarily drawn to single crystal turbine blades, one of ordinary skill in the art would be competent in identifying the thermal and mechanical stresses of the additional components specifically described by Schaeffer (i.e. combustor liners) and determining how best to orient the crystallographic directions for these components according to Schaeffer's teachings. Schaeffer (e.g. column 4, lines 13-21) furthermore discloses that suitable materials for his invention include those single crystal alloys disclosed in U.S. Patent Application Serial No. 08/270,528 (now U.S. Patent 6,074,602 to Wukusick et al.) which discloses fcc single crystal alloys which consists essentially of 5-10 wt.% Cr, 5-10 wt.% Co, 3-8 wt.% Ta, 5-7 wt.% Al, 3-8 wt.% W (e.g. see claim 1 of the Wukusick patent) and a gamma prime volume fraction in excess of 60% (e.g. see claim 11 of the Wukusick patent). Although the range endpoints of Wukusick are not the same range endpoints of the claimed composition, the ranges overlap and therefore the subject matter as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made to have selected the overlapping portion of the range disclosed by the reference because overlapping ranges have been held to be a prima facie case of obviousness, see *In re Malagari*, 182 USPQ 549. Since Schaeffer discloses the application of his invention alternatively for turbine blades and combustor liners, it would have been obvious to one of ordinary skill in the art at the time the invention was made that the compositions and principles disclosed by Schaeffer would be applicable to the manufacture of combustor liners. Schaeffer may differ from some of

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the pending claims in that Schaeffer does not illustrate gas turbine combustor panel configurations, but the examiner notes that the illustration of the gas turbine combustor structure of applicant's Figure 1 is a typical combustor configuration in the art. It would have been obvious to one of ordinary skill in the art to apply the teachings of Schaeffer to typical prior art combustor panel configurations because Schaeffer discloses that his teachings result in improved useful life of turbine components. Applying Schaeffer's teachings within predetermined alignment tolerances and/or using simulations to determine alignment goals would be within the purview of one of ordinary skill in the art and would have been obvious in order to optimize the invention of Schaeffer and also to determine acceptable performance tolerances for various components, compositions and/or environments. Using Schaeffer's teachings to make original and/or replacement turbine combustor components would have been obvious to one of ordinary skill in the art at the time the invention was made because one of ordinary skill in the art would readily appreciate that the improved properties conferred by Schaeffer's teachings would benefit original and/or replacement components alike.

5. Claims 1-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brown (U.S. Patent 5,682,747) in view of applicant's disclosure of the prior art and Gell (U.S. Patent 4,116,723).

6. Brown discloses that single crystal substrates used for combustor shields can have their crystallographic orientation optimized so that the primary crystal orientation will be identified relative to the axial direction of the heat shield member while the secondary crystal orientation is

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normal to the primary crystal orientation and in the plane of the base portion (e.g. see column 4, lines 12-31). Brown discloses the crystallographic orientation suggested by his invention promotes durability with respect to the stresses within the shield components. Brown may differ from the claim 8 in that the Rene N5 composition in the example may not be the same, applicant disclose that the compositions of Gell (e.g. U.S. Patent 4,116,723) are typical prior art single crystal compositions used in gas turbine components (e.g. see paragraph [0023]). It would have been obvious to one of ordinary skill in the art at the time the invention was made that compositions used for turbine blades would be of sufficient durability for combustor shields because they are developed specifically to withstand the extreme stresses and high temperatures in turbine engines. Although the range endpoints of the fcc gamma prime single crystal alloys of Gell (e.g. see claim 1 of Gell) are not the same range endpoints of the applicant's claimed composition (e.g. see applicant's claim 8), the ranges overlap and therefore the subject matter as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made to have selected the overlapping portion of the range disclosed by the reference because overlapping ranges have been held to be a prima facie case of obviousness, see *In re Malagari*, 182 USPQ 549. Brown may differ from some of the pending claims in that Brown may not illustrate the same type of gas turbine combustor panel configurations as those illustrated by applicant, but the examiner notes that the illustration of the gas turbine combustor structure of applicant's Figure 1 is a typical combustor configuration in the art. It would have been obvious to one of ordinary skill in the art to apply the teachings of Brown to any typical prior art combustor panel configurations because Brown discloses that his teachings result in improved useful life of turbine combustor components. Applying Brown's teachings within

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predetermined alignment tolerances and/or using simulations to determine alignment goals would be within the purview of one of ordinary skill in the art and would have been obvious in order to optimize the invention of Brown and also to determine acceptable performance tolerances for various components, compositions and/or environments. Using Brown's teachings to make original and/or replacement turbine combustor components would have been obvious to one of ordinary skill in the art at the time the invention was made because one of ordinary skill in the art would readily appreciate that the improved properties conferred by Brown's teachings would benefit original and/or replacement components alike.

7. Claims 1-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gemma (U.S. Patent 4,605,452) in view of Schaeffer (U.S. Patent 5,843,586) and Gell (U.S. Patent 4,116,723) and further in view of applicant's disclosure of the prior art.

8. Gemma discloses that fcc single crystal turbine blade should have their crystallographic orientation optimized so that the [001] primary orientation will correspond with the z axis of the part since the [001] crystal orientation is particularly suited to thermal fatigue resistance (e.g. see claims 1-11). While the disclosure of Gemma differs from the pending claims in that Gemma is drawn primarily to the manufacture of single crystal turbine blades, Schaeffer clearly shows that one of ordinary skill in the art clearly understands that the optimization of the single crystal orientation of turbine blades applies also to the manufacture of combustor liners (e.g. see column 3, lines 40-46). In view of Schaeffer, it would have been obvious to one of ordinary skill in the art that the crystallographic orientation optimization of Gemma for turbine blades would apply

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equally well to the stresses in turbine combustion liners. As shown by Schaeffer, one of ordinary skill in the art would be competent in identifying the thermal and mechanical stresses of the turbine combustor components and determining how best to orient the crystallographic directions for these components. Gemma further discloses that the compositions of Gell (e.g. U.S. Patent 4,116,723) are typical prior art single crystal compositions used in gas turbine components for his invention (e.g. see column 5, lines 29-49). It would have been obvious to one of ordinary skill in the art at the time the invention was made that compositions used for turbine blades would be of sufficient durability for combustor shields because they are developed specifically to withstand the extreme stresses and high temperatures in turbine engines. Schaeffer confirms the alternative use of turbine technology for blades and combustors alike. Although the range endpoints of the fcc gamma prime single crystal alloys of Gell (e.g. see claim 1 of Gell) are not the same range endpoints of the applicant's claimed composition (e.g. see applicant's claim 8), the ranges overlap and therefore the subject matter as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made to have selected the overlapping portion of the range disclosed by the reference because overlapping ranges have been held to be a prima facie case of obviousness, see *In re Malagari*, 182 USPQ 549.

Regarding typical gas turbine combustor panel configurations, the examiner notes that the illustration of the gas turbine combustor structure of applicant's Figure 1 is a typical combustor configuration in the art. In view of Schaeffer, it would have been obvious to one of ordinary skill in the art to apply the teachings of Gemma to typical prior art combustor panel configurations in order to improve the useful life of turbine components. Applying Gemma's teachings within predetermined alignment tolerances and/or using simulations to determine



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alignment goals would be within the purview of one of ordinary skill in the art and would have been obvious in order to optimize the invention of Gemma and also to determine acceptable performance tolerances for various components, compositions and/or environments. Using Gemma's teachings to make original and/or replacement turbine components would have been obvious to one of ordinary skill in the art at the time the invention was made because one of ordinary skill in the art would readily appreciate that the improved properties conferred by Gemma's teachings would benefit original and/or replacement components alike.

9. Regarding the use of applicant's disclosure of the prior art in the rejections, above, it is axiomatic that consideration of the prior art cited by the examiner must, of necessity, include consideration of the admitted state of the art found in applicant's specification, *In re Davis*, 305 F.2d 501, 134 USPQ 256 (CCPA 1962); *In re Hedges*, 783 F.2d 1038, 228 USPQ 685 (Fed. Cir. 1986). Admitted knowledge in the prior art may be used in determining patentability of the claimed subject matter, *In re Nomiya*, 509 F.2d 566, 184 USPQ 607 (CCPA 1975).

### ***Response to Arguments***

10. Applicant's arguments received November 23, 2005 have been considered. Applicant argued that the prior rejection applying Gemma (U.S. Patent No. 4,605,452) under 35 U.S.C. 102(b) failed to address the issues of combustor components contained in the pending claims. The current examiner finds applicant's arguments convincing and the rejection applying Gemma in the prior Detailed Action of August 24, 2005 has been withdrawn. New rejections which address the combustor component recitations of the pending claims have been presented above.

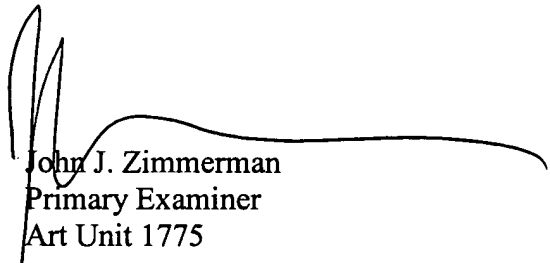
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***Conclusion***

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The additional art of record serves to further establish the level of ordinary skill in the art at the time the invention was made.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to John J. Zimmerman whose telephone number is (571) 272-1547. The examiner can normally be reached on 8:30am-5:00pm, M-F. Supervisor Deborah Jones can be reached on (571) 272-1535. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

13. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
John J. Zimmerman  
Primary Examiner  
Art Unit 1775

jjz  
February 1, 2006